L Number	Hits	Search Text	DB	Time stamp
1	10448	(resistor or switch) same etch$3	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 09:56
2	61	((resistor or switch) same etch$3) same (ferric near chloride or "FeCl.sub.3")	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 13:13
3	1	(((resistor or switch) same etch$3) same (ferric near chloride or "FeCl.sub.3")) same (etch$3 near stop$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 09:58
4	0	(((resistor or switch) same etch$3) same (ferric near chloride or "FeCl.sub.3")) and @pd<09980914	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 10:00
5	44	(((resistor or switch) same etch$3) same (ferric near chloride or "FeCl.sub.3")) and @pd<19980914	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 10:13
6	7	((((resistor or switch) same etch$3) same (ferric near chloride or "FeCl.sub.3")) and @pd<19980914) and (etch$3 near3 stop$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 10:00
7	1	((((resistor or switch) same etch$3) same (ferric near chloride or "FeCl.sub.3")) and @pd<19980914) and (iron near nickel or "Fe-Ni")	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 10:12
8	1440	etch$3 same (iron near nickel or "Fe-Ni")	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 10:12
9	12	(etch$3 same (iron near nickel or "Fe-Ni")) same (etch$3 near5 stop$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 10:13
10	4749346	"12" and @pd<19980914	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 10:15
11	10	((etch$3 same (iron near nickel or "Fe-Ni")) same (etch$3 near5 stop$3)) and @pd<19980914	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 10:27
12	1	(((etch$3 same (iron near nickel or "Fe-Ni")) same (etch$3 near5 stop$3)) and @pd<19980914) and (ferric near chloride or "FeCl.sub.3")	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 10:30
13	97347	etch$3 same metal	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 10:28

14	4075	(etch$3 same metal) same (etch$3 near stop$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 13:03
15	8	((etch$3 same metal) same (etch$3 near stop$3)) same (ferric near chloride or "FeCl.sub.3")	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 12:15
16	26985	(etch$3 same metal) same (resist$4 or sensor or switch)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 12:19
17	197	((etch$3 same metal) same (resist$4 or sensor or switch)) same ((back near side) or (reverse near side))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 12:21
18	8	(((etch$3 same metal) same (resist$4 or sensor or switch)) same ((back near side) or (reverse near side))) same (etch$3 near stop$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 12:56
19	262	wienand.in.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 12:58
20	45	wienand.in. and (recess or hole)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 12:58
21	4	(wienand.in. and (recess or hole)) and (etch$3 near stop$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 12:59
22	11067	metal same (etch$3 near10 (recess or hole))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 13:04
23	252	(metal same (etch$3 near10 (recess or hole))) and ((etch$3 near stop$3) same (titanium or platinum or nickel))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 13:10
24	78	((metal same (etch$3 near10 (recess or hole))) and ((etch$3 near stop$3) same (titanium or platinum or nickel))) and @pd<19980914	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 13:12
25	73	(((metal same (etch$3 near10 (recess or hole))) and ((etch$3 near stop$3) same (titanium or platinum or nickel))) and @pd<19980914) and (resist$4 or switch or sensor or thermometer)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 13:13
26	1	((((metal same (etch$3 near10 (recess or hole))) and ((etch$3 n ar stop$3) same (titanium or platinum or nickel))) and @pd<19980914) and (resist$4 or switch or sensor or thermometer)) and (ferric near chloride or "FeCl.sub.3")	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/12/03 13:14
-	121	resistor same (metal near etch$3)	USPAT; US-PGPUB	2002/11/27 15:10

-	0	((resistor same (metal near etch$3)) same (etch$3 near stop)) and @<19980914	USPAT; US-PGPUB	2002/11/27 14:53
-	0	((resistor same (metal near etch$3)) same (etch$3 near stop)) and @pd<19980914	USPAT; US-PGPUB	2002/11/27 14:53
-	6	(resistor same (metal near etch$3)) same (etch$3 near stop)	USPAT; US-PGPUB	2002/11/27 14:57
-	4	(electrical near resistor) same (etch$3 near stop)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/11/27 14:58
-	1898	(metal same etch$3) same resistor	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/11/27 15:22

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DISCLOSURE TEXT:

This document contains drawings, formulas, and/or symbols that will not appear on line. Request hardcopy from ITIRC for complete article.

Disclosed is a Thin Film Transistor (TFT) structure with source and drain electrode self-aligned to etching stopper edge shape. With this structure, on current of TFT increases due to the reduction of channel length. As the uniformity of the capacitance between gate and source electrode is improved, the area of storage capacitor decreases and aperture ratio of TFT panel increases.

Because of the misalignment of the aligner in photo process, the margin between source/drain electrode and etching stopper is needed with conventional TFT structure and process.

This invention discloses a way to reduce the margin between source/drain electrode and etching stopper.

After making gate line, SiOx, SiNx and amorphous silicon are deposited in PECVD and two layers of etching stopper SiNx is deposited that are made in high temperature (such as 300 degrees C) and low temperature (such as 200 degrees C). After coating photoresist (Fig. 1), by back-side exposure the photoresist except above the gate electrode is exposed, and photoresist remains only above the gate electrode after

developing process (Fig. 2).

Then etching stopper is etched using buffered HF (Fig. 3), and photoresist stripped off (Fig. 4), and n+ microcrystalline silicon is deposited in PECVD (Fig. 5). Buffered HF etching is made, and as low-temperature-deposited SiNx dissolves in buffered HF very fast, n+ microcrystalline silicon above gate electrode is lifted off and source/drain n+ microcrystalline silicon remains (Fig. 6). After cutting amorphous silicon island (Fig. 7), data line metal is deposited and patterned in order to connect to n+ microcrystalline source/drain electrode (Fig. 8).

Black photo resist for the black matrix layer is coated and patterned and the region on the source/drain electrode made of n+ microcrystalline is covered with black matrix to prevent from the exposure of ambient light.

This technique can also be made using metal oxide or metal nitride like SiOx, AlOx, SnO, ITO. This structure and method can also be used in the image sensor process.